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BEAM-BEAM INTERACTION IN AN ASYMMETRIC COLLIDER FOR B-PHYSICS.*
Y.H. Chin, Lawrence Berkeley Laboratory, University of California, USA--The beam-beam interaction in an asymmetric beam-collider is studied in terms of computer simulation. An asymmetric collider consists of two independent rings whose machine and beam characteristics may be totally different. By nature, beams in the two rings tend to behave asymmetrically. As the result, the weaker beam will blow up badly setting a very low beam-beam limit, while the stronger beam suffers practically no blow-up. The goal of study is therefore to symmetrize the beam-beam interaction in an asymmetric collider so that two beams blow up equally, reducing the strength of beam-beam force for both beams simultaneously. By this way, the beam-beam limit may be maximized to the level observed in symmetric colliders. It is found that one may achieve this goal by setting the following parameters equal in the two rings: the transverse beam sizes at the collision point, the beam-beam parameters, the radiation damping decrement, and the betatron tune modulation due to synchrotron motion which is characterized by $\nu_s \sigma_s / (2\beta^*)$ where ν_s is the synchrotron tune, σ_s is the bunch length, and β^* is the beta function at the collision point.

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